Figure 1: Experimental procedure for the *in vitro* selection.

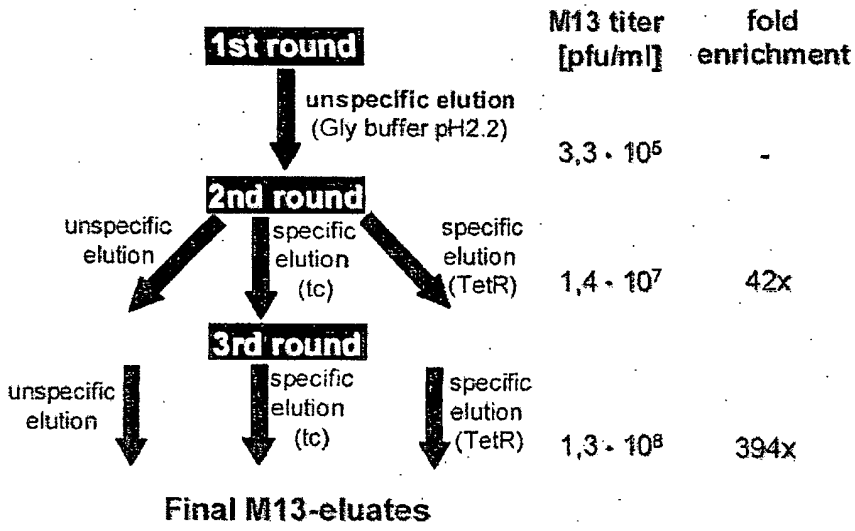


Figure 2: Example for *in vitro* selected sequences.

- Unspecific elution (Gly buffer, pH 2.2)

```
pep1   Trp - His - Gly - Ala - Ile - Leu - Gly - Ser - Ala - Arg - Ala - Gln
pep2   Leu - Pro - Ser - Tyr - Met - Leu - His - Leu - Trp - Ser - Pro - His
pep3   Ala - His - Tyr - Ser - Leu - Tyr - Trp - Pro - Met - Ala - Thr - Phe
pep4   Tyr - His - Asn - Leu - Tyr - Gly - Leu - Pro - Leu - Gly - Pro - Trp
pep5   Trp - His - Gln - Thr - Tyr - Thr - Ser - Ser - Leu - Trp - Glu - Ser
```

- Specific elution (TetR, 4µM)

```
pep1   Trp - Thr - Trp - Asn - Ala - Tyr - Ala - Phe - Ala - Ala - Pro - Ser
pep2   Trp - His - Ser - Ser - Phe - Asn - Met - Phe - Ala - Tyr - Pro - Met
pep3   Trp - His - Leu - Pro - Leu - Ser - Trp - Thr - Thr - Arg - Leu - Pro
pep4   Trp - His - Thr - Pro - Ile - Ser - Leu - Leu - Lys - Gln - Val - Arg
pep5   Trp - His - Trp - Thr - Phe - Ser - Ser - Pro - Leu - Met - Gln - Thr
```

Figure 3: Characterisation of TetR-phage binding by ELISA.

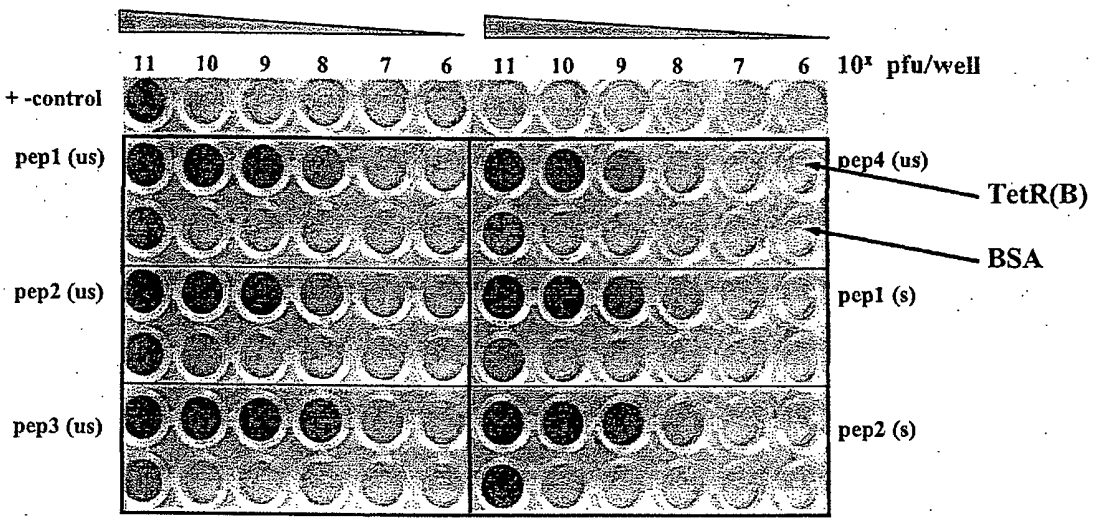


Figure 4: Design of the peptide expressing construct.

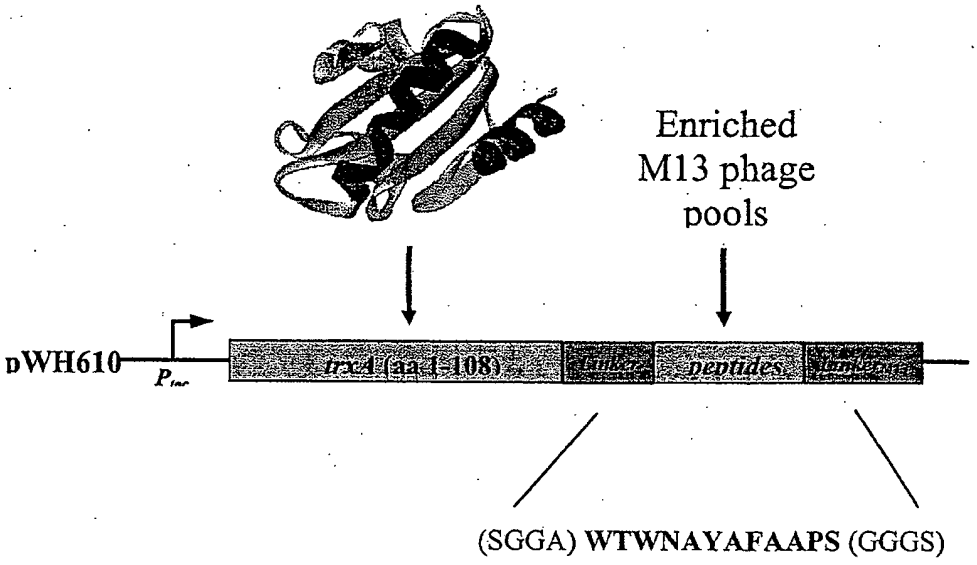


Figure 5: Setup of the *in vivo* screening system.

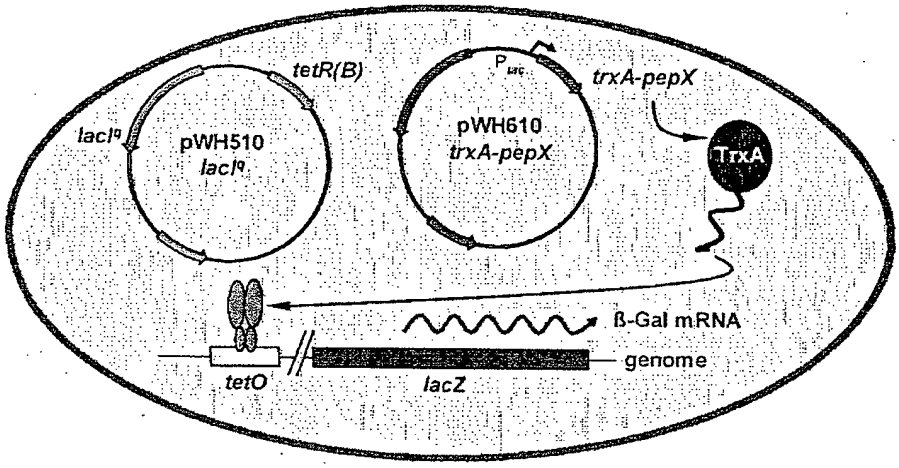
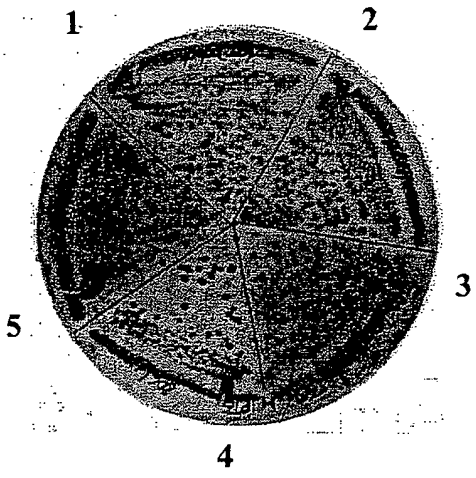


Figure 6: McConkey plate.



box	Plasmid I* encoding	Plasmid II** encoding	ß-Gal activity
1	TetR(B)	TrxA-pepBs1	+
2	TetR(B)	TrxA-pepBs1	+
3	TetR(B)	-	-
4	-	-	+ (100%)
5	TetR(B)	TrxA	-

* pWH510*lacI*^{q} for TetR(B), pWH1200 (Altschmied et al., 1988)
** pWH610 for TrxA/TrxA-pepBs1, pWH806 (Wissmann et al., 1991)
"+" = induced (yellow colonies)
"-" = uninduced (colorless colonies)

Figure 7: LacZ assay for the TetR-inducing fusion protein TrxA-pepBs1.

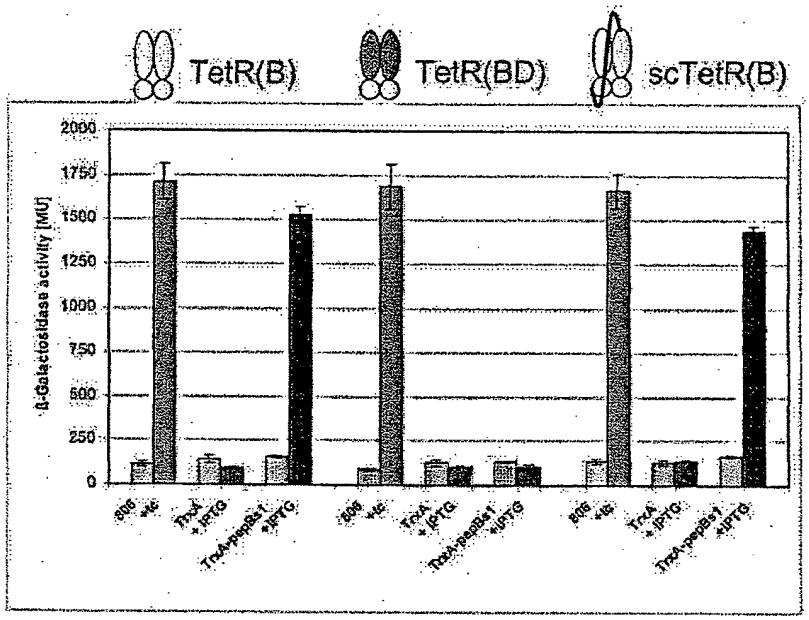


Figure 8: Identification of the region of interaction between TetR and TrxA-pepBs1 by in *vivo* epitope mapping.

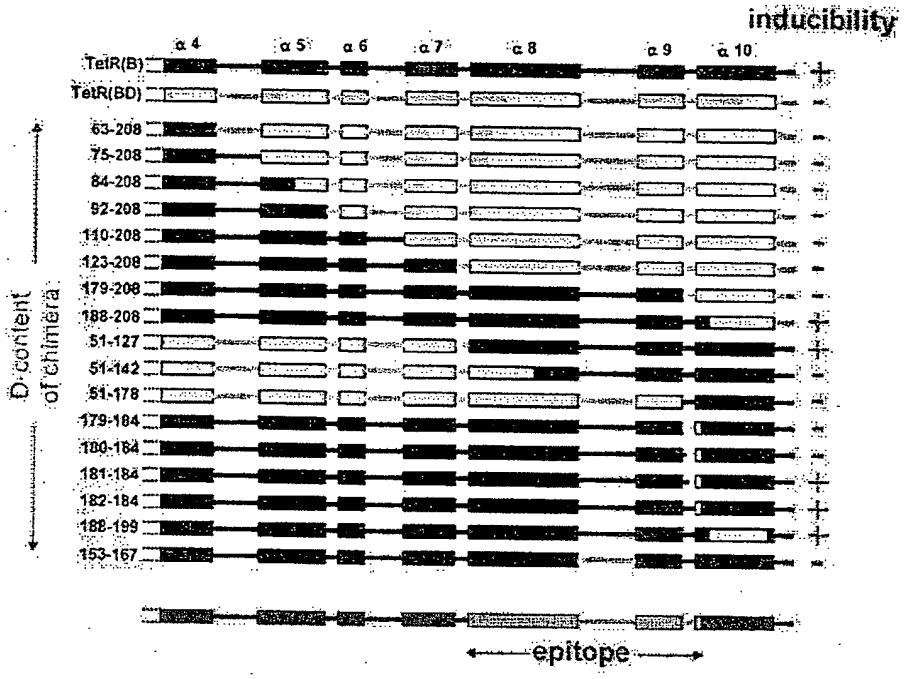


Figure 9: Structure of TetR.

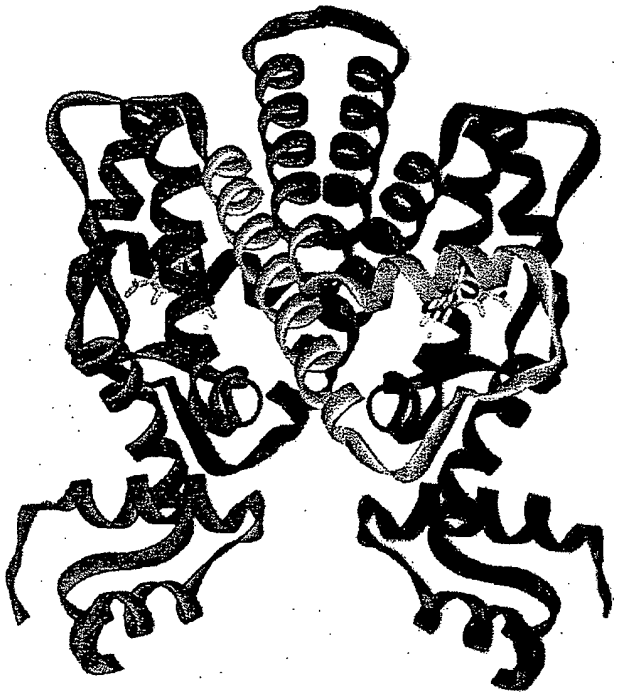


Figure 10: Expression of the peptide correlates with induction of TetR.

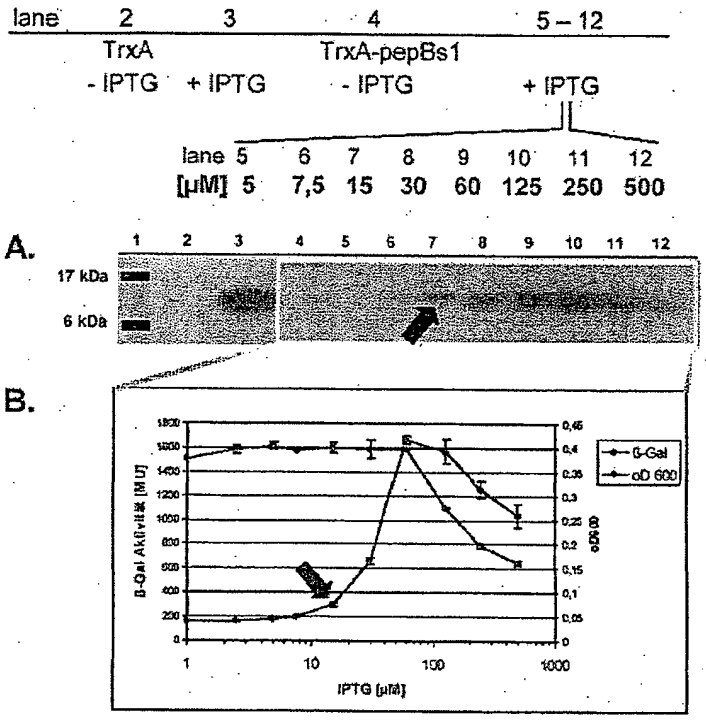


Figure 11: ***In vivo*** **characterisation of non-inducible TetR mutants.**

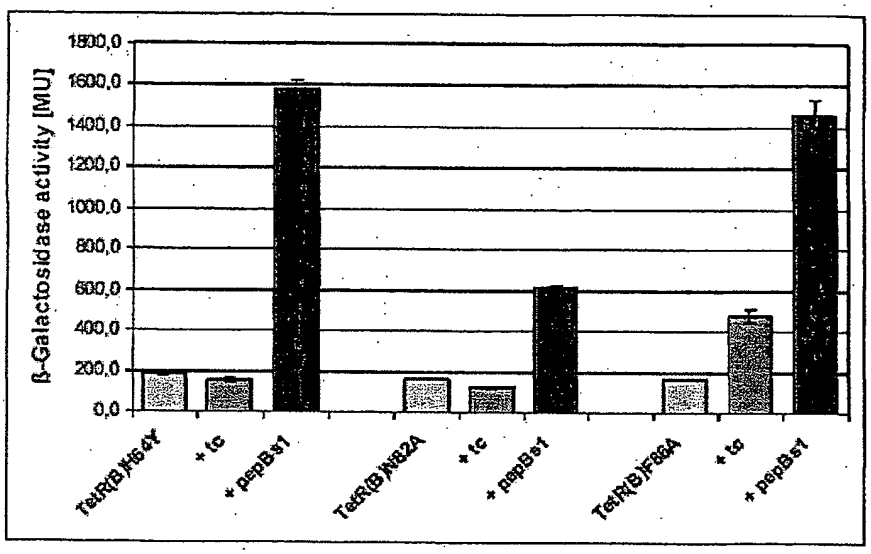


Figure 12: Position of the amino acids H64, N82 and F86 relative to tetracycline and the interaction epitope.

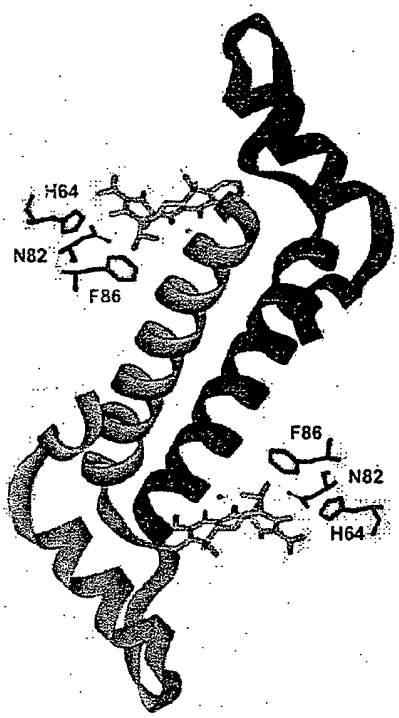


Figure 13: Amino acids contacting tc.

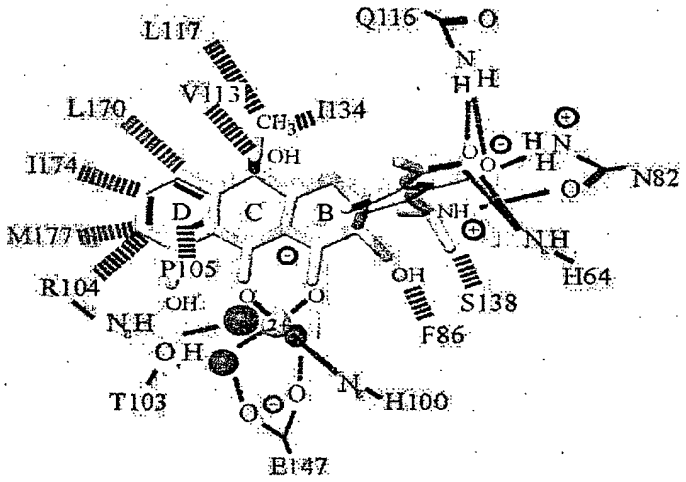


Figure 14: ***In vivo*** **characterisation of TetR inducibility by TrxA fusion proteins.**

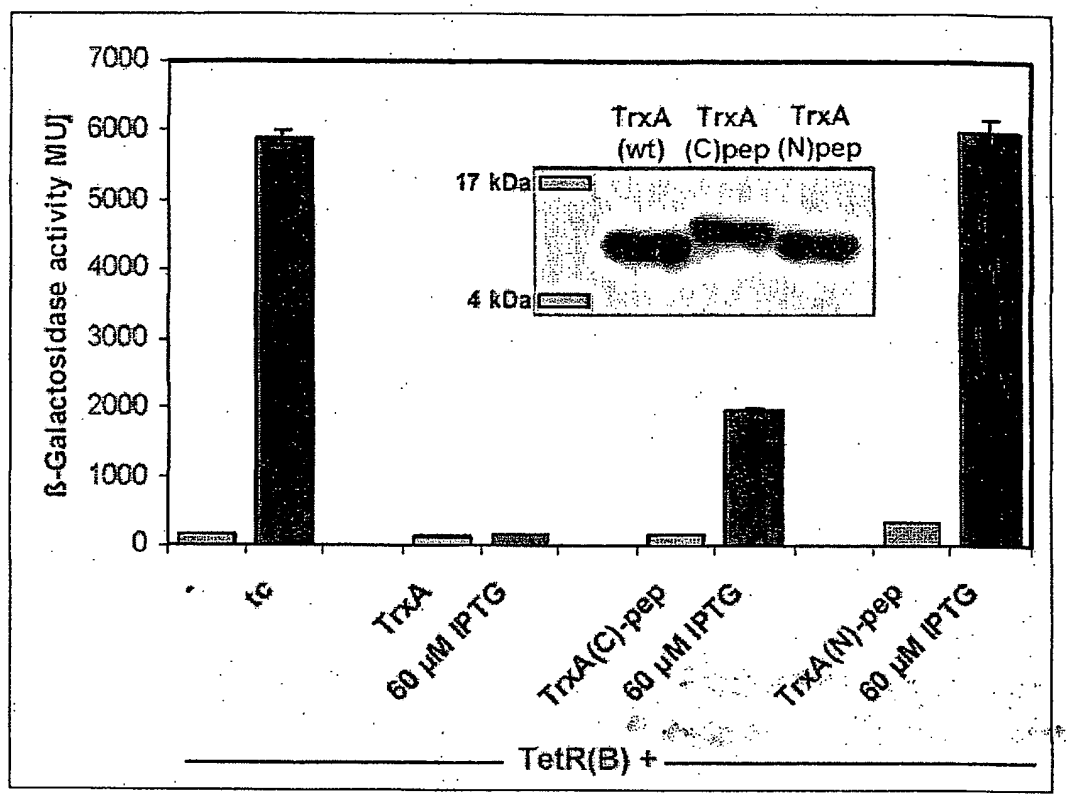


Figure 15: Correlation between the protein level and induction of TetR(B).

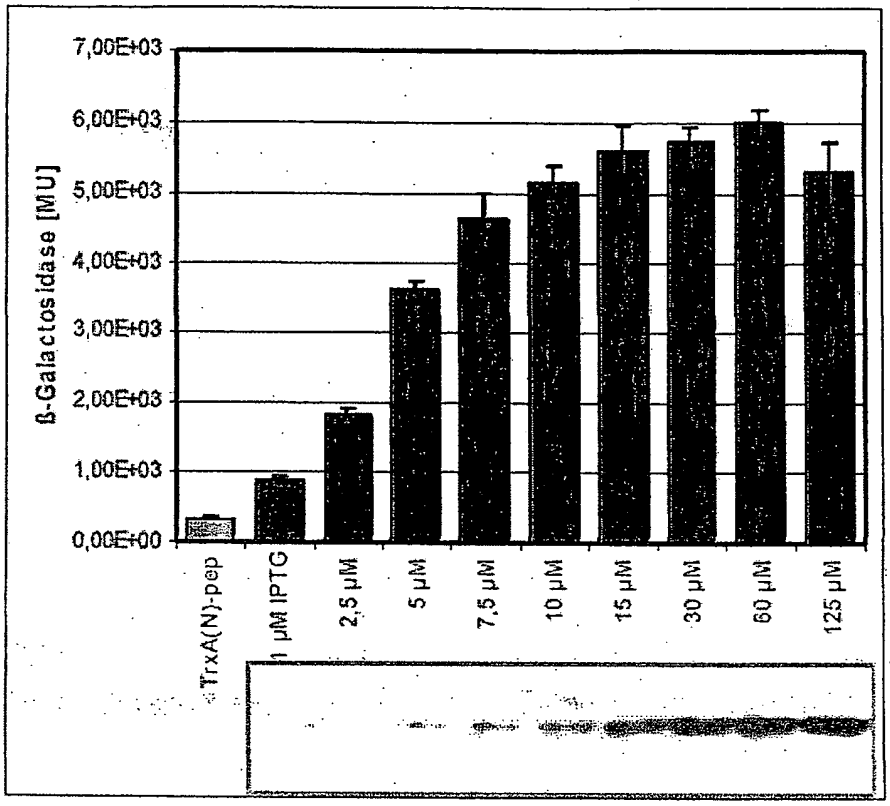


Figure 16: Comparison of a low and high TetR-expressing system.

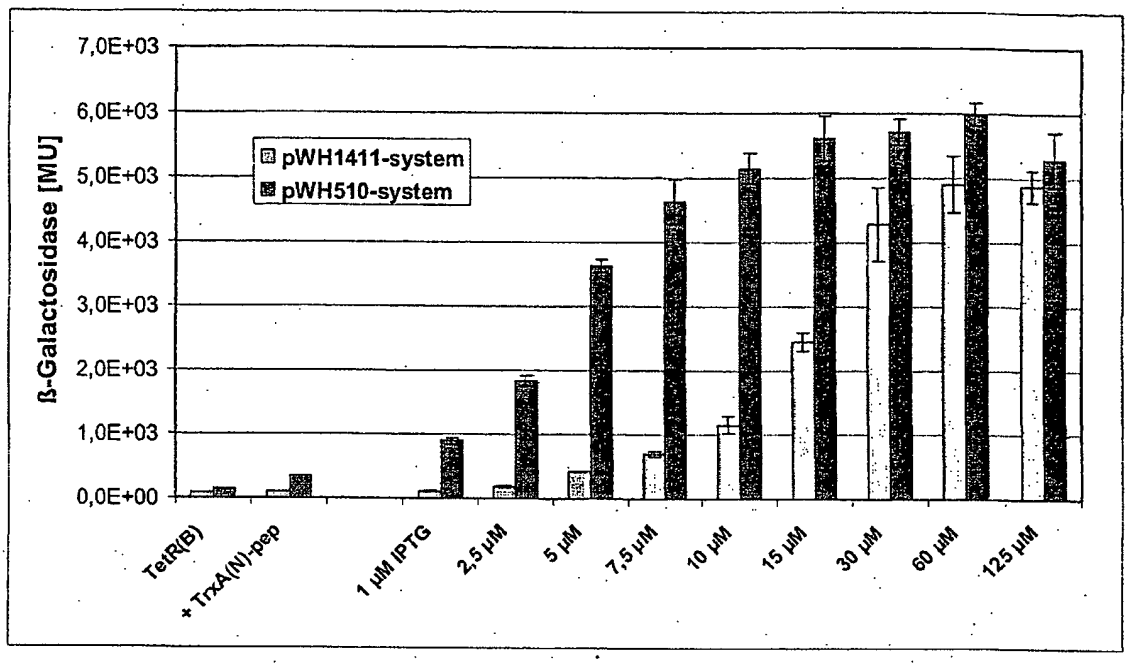


Figure 17: Comparison of TetR(B) induction by C- and N-terminal TrxA-peptide fusions.

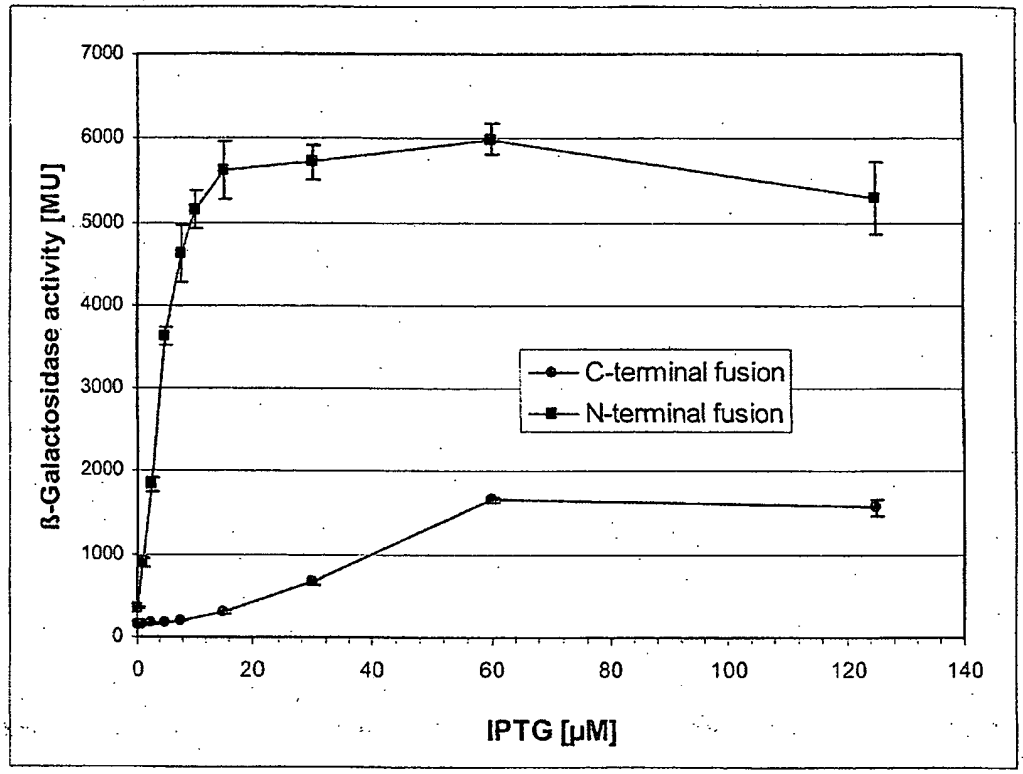


Figure 18: LacZ assay for the TetR-inducing fusion protein SbmC-pepBs1.

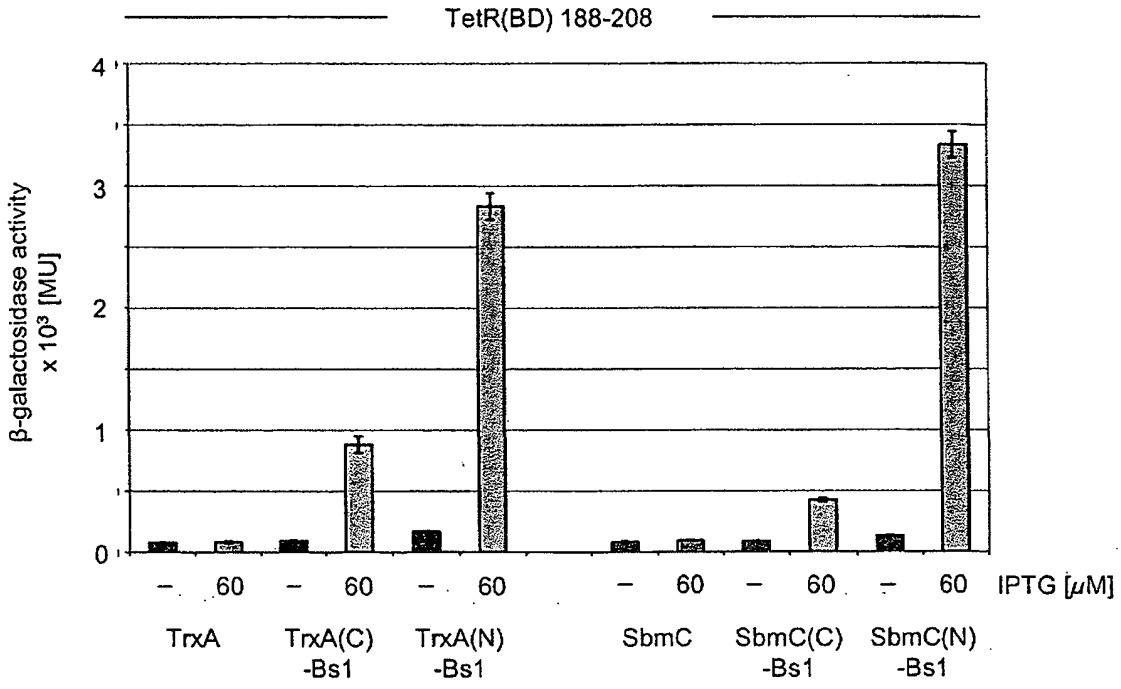


Figure 19: An in-frame fusion of an insertion element (IE^{FKS}) encoding the peptide Bs1 to TrxA leads to a protein that induces TetR(B).

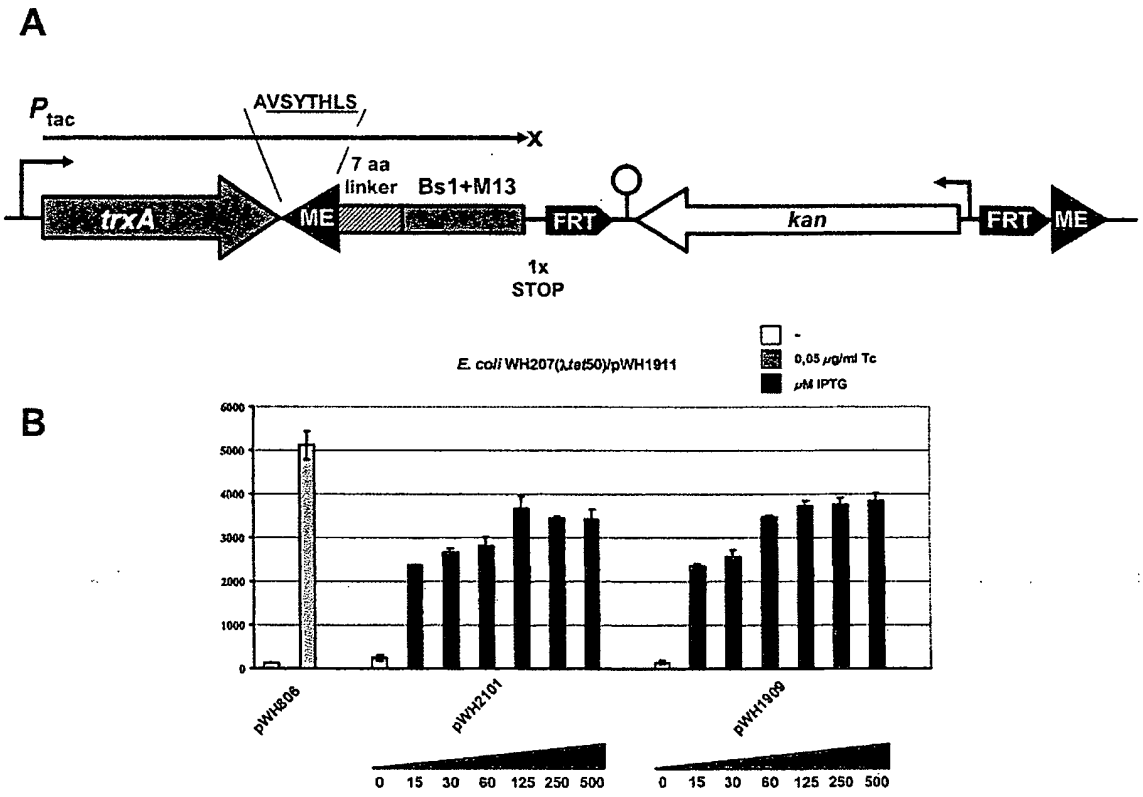


Figure 20: An in-frame fusion of the insertion element IE^{FSK} to the *atpD* ORF at its endogenous location in the *E. coli* genome leads to a protein that induces TetR(B).